

Vitramon, Incorporated

Monolithic Ceramic Chip Capacitors



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Thomas & Betts

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HOW TO ORDER

VJ0805 **A** **101** **K** **X** **A** **M** **T**

Style _____

Temperature Characteristic
 A = NPO & BP ... 0 ± 30ppm/°C
 X = BX ± 15% @ 0 Vdc and + 15%,
 -25% at rated Vdc
 Y = X7R ... ± 15%
 U = Z5U ... + 22%, - 56%

Capacitance
 Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow. An 'R' denotes a decimal point in which case all figures are significant.

Capacitance Tolerance
 NPO and High Q:
 C = ± .25pF D = ± .5pF
 F = ± 1% G = ± 2%
 J = ± 5% K = ± 10%
 BX and X7R: K (± 10%) and M (± 20%) are standard.
 J (± 5%) also available.
 Z5U: M (± 20%) and Z (+ 80% - 20%) are standard.
 P (+ 100%, - 0%)

Termination Material
 H = Palladium-Silver, Sn62 Solder coated finish F = Palladium-Silver
 N = Silver, Nickel Barrier, Sn62 Solder coated finish X = Silver, Nickel
 Barrier, Tin Plated finish

VOLTAGE (Vdc)
 X = 25 A = 50 B = 100 C = 200 D = 300 E = 500

MARKING OPTION **Standard is No Marking**
 A = No Marking M = EIA Marking H = EIA Marking
 Plus "V" for Vendor identity (See Page 19.)

PACKAGING OPTION **Standard is Bulk**
 T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle



VITRAMON*, Incorporated has been dedicated to the manufacture of high quality monolithic capacitors for industrial, consumer, medical and military users (using the VITRAMON* proprietary wet build-up process) since the company was incorporated in 1948.

We have placed particular emphasis on the monolithic ceramic chip capacitor—a critical circuit element in the expanding use of Surface Mounted Technology, as well as in traditional hybrid applications.

Our North American manufacturing facilities are located in Monroe, Connecticut and Roanoke, Virginia. VITRAMON* has long believed in providing a local source for consumers of ceramic capacitors worldwide. Accordingly, we operate manufacturing facilities in West Germany, England, France and Brazil. These operations are augmented by sales offices in Australia and Japan.

VITRAMON* realizes that Surface Mounted Technology requires a new level of quality of the components being utilized, both electrically and physically. In anticipation of these needs, we have invested in new dielectric formulations, electrode alloy systems, and end termination compositions. Each step in the process uses statistical process control to insure we are consistently meeting customer needs. VITRAMON* is dedicated to never ending improvement.

Our product line offers a variety of dielectrics which are available with a palladium/silver end termination or our barrier style termination. VITRAMON* is proud to have been one of the first to realize the need for a rugged barrier layer termination. Today VITRAMON* is one of the largest suppliers of plated barrier terminated ceramic chip capacitors in North America.

We at VITRAMON*, Incorporated look forward to serving your ceramic chip capacitor needs.

*"VITRAMON" in this context refers to the organization developing, manufacturing and selling products under the name "VITRAMON" and other copyrighted trademarks.

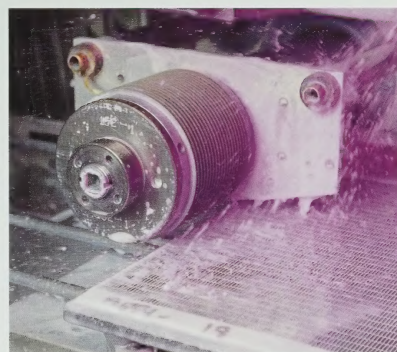
RESEARCH & DEVELOPMENT



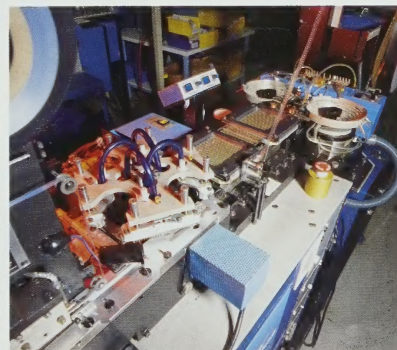
ELECTRICAL TESTING



CHIP CUTTING

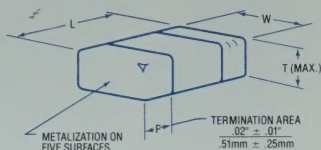
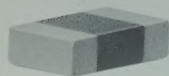


TAPE-REEL PACKAGING





NPO (COG) DIELECTRIC



HOW TO ORDER

VJ0805 A 101 K X A M T

Style _____

Temperature Characteristic
A = NPO ... 0 \pm 30ppm/ $^{\circ}$ C

Capacitance
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow. An 'R' denotes a decimal point in which case all figures are significant.

Capacitance Tolerance
C = \pm .25pF D = \pm .5pF
F = \pm 1% G = \pm 2%
J = \pm 5% K = \pm 10%

Termination Material
H = Palladium-Silver, Sn62 Solder coated finish F = Palladium-Silver
N = Silver, Nickel Barrier, Sn62 Solder coated finish X = Silver, Nickel
Barrier, Tin Plated finish

VOLTAGE (Vdc)
A = 50 B = 100

MARKING OPTION Standard is No Marking
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

SURFACE MOUNT STANDARD SIZES

PART NO.	VJ0805	VJ1206	VJ1210	VJ1812	VJ1825
Length (L)	.079 (2.00)	.126 (3.20)	.126 (3.20)	.177 (4.50)	.177 (4.50)
Width (W)	.049 (1.25)	.063 (1.60)	.098 (2.50)	.126 (3.20)	.252 (6.40)
Thickness (T)	.051 (1.30)	.059 (1.50)	.067 (1.70)	.067 (1.70)	.067 (1.70)
Term. (P)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	100 50	100 50	100 50	100 50	100 50
Cap. in pF	1.0				
	1.2				
	1.5				
	1.8				
	2.2				
	2.7				
	3.3				
	3.9				
	4.7				
	5.6				
	6.8				
	8.2				
	10				
	12				
	15				
	18				
	22				
	27				
	33				
	39				
	47				
	56				
	68				
	82				
	100				
	120				
	150				
	180				
	220				
	270				
	330				
	390				
	470				
	560				
	680				
	820				
	1000				
	1200				
	1500				
	1800				
	2200				
	2700				
	3300				
	3900				
	4700				
	5600				
	6800				
	8200				
Cap. in uF	.010				
	.012				
	.015				
	.018				
	.022				
	.027				
	.033				
	.039				
	.047				

Dimensions on length, width and termination are $\pm .01"$ ($\pm .25$ mm), except VJ0603 termination is .005" (.127) mm, minimum.

Capacitance values are offered in the following significant figures: 10 11 12 13 15 16 18 20 22 24 27 30 33 36 39 43 47 51 56 62 68 75 82 91

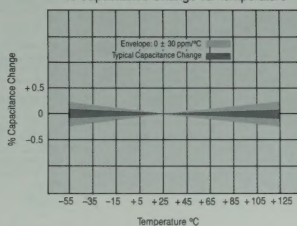
Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

NOTE: Body dimensions do not include solder build-up. For additional capacitance values and voltages not shown, contact the factory.

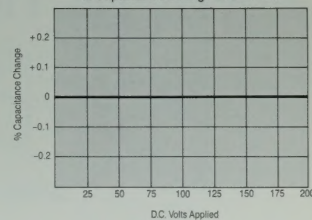
OTHER SIZES

PART NO.	VJ0603	VJ0907	VJ1808	VJ2224
Length (L)	.063 (1.60)	.090 (2.29)	.180 (4.57)	.220 (5.59)
Width (W)	.031 (0.80)	.070 (1.78)	.080 (2.03)	.240 (6.10)
Thickness (T)	.035 (0.89)	.060 (1.52)	.065 (1.65)	.070 (1.78)
Term. (P)	.005 (.127)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	100 50	100 50	100 50	100 50
Cap. in pF	1.0			
	1.2			
	1.5			
	1.8			
	2.2			
	2.7			
	3.3			
	3.9			
	4.7			
	5.6			
	6.8			
	8.2			
	10			
	12			
	15			
	18			
	22			
	27			
	33			
	39			
	47			
	56			
	68			
	82			
	100			
	120			
	150			
	180			
	220			
	270			
	330			
	390			
	470			
	560			
	680			
	820			
	1000			
	1200			
	1500			
	1800			
	2200			
	2700			
	3300			
	3900			
	4700			
	5600			
	6800			
	8200			
Cap. in uF	.010			
	.012			
	.015			
	.018			
	.022			
	.027			
	.033			
	.039			
	.047			

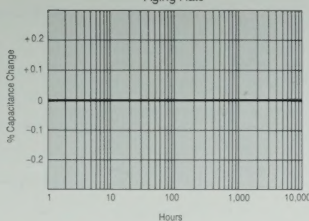
% Capacitance Change vs. Temperature



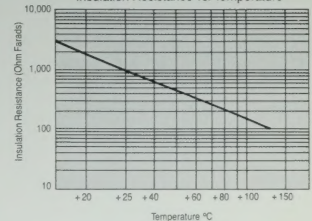
% Capacitance Change vs. D.C. Volts



Aging Rate



Insulation Resistance vs. Temperature



NPO (COG) Dielectric General Specifications

Capacitance Range: 1.0 pF to .047 uF

Operating Temperature Range: -55°C to +125°C

Temperature Characteristic: 0 ± 30 ppm/°C

Voltage Ratings: 100 & 50 Vdc @ +125°C

Dissipation Factor: 0.1% (max.) @ +25°C and +125°C @ 1.0

Vrms and 1 kHz for >1000 pF; 1 MHz for ≤1000 pF

Insulation Resistance @ +25°C and rated Vdc:

100,000 megohms (min.) or 1000 ohm-farads (min.),
whichever is less

Insulation Resistance @ +125°C and rated Vdc:

10,000 megohms (min.) or 100 ohm-farads (min.),
whichever is less

Dielectric Withstanding Voltage: 250% of rated voltage for 5 ± 1
seconds, 50 milliamps (max.).

Capacitance Tolerances

C = ±0.25 pF (1.0 to 25 pF)

D = ±0.50 pF (1.0 to 50 pF)

F = ±1% (25 pF and up)

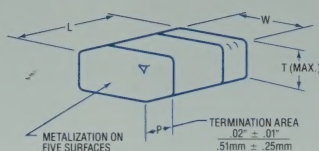
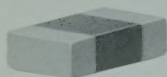
G = ±2% (13 pF and up)

J = ±5% (5 pF and up)

K = ±10% (2.5 pF and up)



X7R DIELECTRIC



HOW TO ORDER

VJ0805 **Y** **103** **K** **X** **A** **M** **T**

Style _____

Temperature Characteristic
Y = X7R ... $\pm 15\%$

Capacitance
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow.

Capacitance Tolerance
K ($\pm 10\%$) and M ($\pm 20\%$) are standard.
J ($\pm 5\%$) also available.

Termination Material
H = Palladium-Silver, Sn62 Solder coated finish F = Palladium-Silver
N = Silver, Nickel Barrier, Sn62 Solder coated finish X = Silver, Nickel
Barrier, Tin Plated finish

VOLTAGE (Vdc)
A = 50 B = 100

MARKING OPTION Standard is No Marking
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

SURFACE MOUNT STANDARD SIZES

PART NO.	VJ0805	VJ1206	VJ1210	VJ1812	VJ1825
Length (L)	.079 (2.00)	.126 (3.20)	.126 (3.20)	.177 (4.50)	.177 (4.50)
Width (W)	.049 (1.25)	.063 (1.60)	.098 (2.50)	.126 (3.20)	.252 (6.40)
Thickness (T)	.051 (1.30)	.059 (1.50)	.067 (1.70)	.067 (1.70)	.067 (1.70)
Term. (P)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	100 50	100 50	100 50	100 50	100 50
Cap. in pF	100 120 150 180 220 270 330 390 470 560 680 820 1000 1200 1500 1800 2200 2700 3300 3900 4700 5600 6800 8200	Available in NPO (COG)	Available in NPO (COG)		
Cap. in uF	.010 .012 .015 .018 .022 .027 .033 .039 .047 .056 .068 .082 .10 .12 .15 .18 .22 .27 .33 .39 .47 .56 .68 .82 1.0				

Dimensions on length, width and termination are $\pm .01"$ ($\pm .25$ mm), except VJ0603 termination is .005" (.127) mm, minimum.

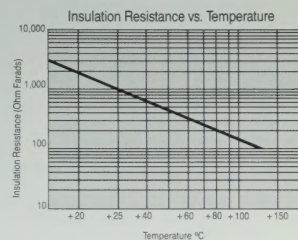
NOTE: Body dimensions do not include solder build-up.

Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

Capacitance values offered in following significant figures: 10 12 15 18 22 27 33 39 47 56 68 82

For additional capacitance values and voltages not shown, contact the factory.

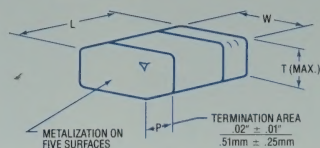
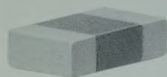
PART NO.		VJ0603	VJ0907	VJ1808	VJ2224
Length (L)		.063 (1.60)	.090 (2.29)	.180 (4.57)	.220 (5.59)
Width (W)		.031 (0.80)	.070 (1.78)	.080 (2.03)	.240 (6.10)
Thickness (T)		.035 (0.89)	.060 (1.52)	.065 (1.65)	.070 (1.78)
Term. (P)		.005 (.127)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)		100 50	100 50	100 50	100 50
Cap. in pF	100	Available in NPO (COG)	Available in NPO (COG)		
	120				
	150				
	180				
	220				
	270				
	330				
	390				
	470				
	560				
	680				
	820				
	1000				
	1200				
	1500				
	1800				
	2200				
	2700				
	3300				
	3900				
	4700				
	5600				
	6800				
	8200				
Cap. in uF	.010				
	.012				
	.015				
	.018				
	.022				
	.027				
	.033				
	.039				
	.047				
	.056				
	.068				
	.082				
	.10				
	.12				
	.15				
	.18				
	.22				
	.27				
	.33				
	.39				
	.47				
	.56				
	.68				
	.82				
	1.0				



Capacitance Range: 470 pF to 1.0 uF
 Capacitance Tolerances: $\pm 5\%$, $\pm 10\%$ and $\pm 20\%$
 Operating Temperature Range: -55°C to $+125^{\circ}\text{C}$
 *Temperature Characteristic: $\pm 15\%$ with 0 Vdc applied
 *Voltage Ratings: 100 & 50 Vdc @ $+125^{\circ}\text{C}$
 Dissipation Factor: 2.5% (max.) @ 1.0 Vrms and 1 kHz
 Insulation Resistance @ $+25^{\circ}\text{C}$ and rated Vdc:
 100,000 megohms (min.) or 1000 ohm-farads (min.),
 whichever is less
 Insulation Resistance @ $+125^{\circ}\text{C}$ and rated Vdc:
 10,000 megohms (min.) or 100 ohm-farads, whichever is less
 Dielectric Withstanding Voltage: 250% of rated voltage for 5 \pm 1
 seconds, 50 milliamps (max.).
 Aging Rate: 1% (maximum) per decade
 *Meets MIL 'BX' Characteristics at 50% of rated voltage



Z5U DIELECTRIC



HOW TO ORDER

VJ0805 U 103 M X A M T

Style _____

Temperature Characteristic
U = Z5U ... + 22%, - 56%

Capacitance _____
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow.

Capacitance Tolerance _____
M ($\pm 20\%$) and Z ($+ 80\% - 20\%$) are standard.
P ($+ 100\%, - 0\%$)

Termination Material _____
X = Silver, Nickel Barrier, Tin Plated finish

VOLTAGE (Vdc) _____
A = 50

MARKING OPTION Standard is No Marking _____
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk _____
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

Dimensions on length, width and termination are $\pm .01"$ ($\pm .25$ mm), except VJ0603 termination is $.005"$ (.127) mm, minimum.

Capacitance values offered in following significant figures: 10 15 22 33 47 68

NOTE: Body dimensions do not include solder build-up.

Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

SURFACE MOUNT STANDARD SIZES

PART NO.	VJ0805	VJ1206	VJ1210	VJ1812	VJ1825
Length (L)	.079 (2.00)	.126 (3.20)	.126 (3.20)	.177 (4.50)	.177 (4.50)
Width (W)	.049 (1.25)	.063 (1.60)	.098 (2.50)	.126 (3.20)	.252 (6.40)
Thickness (T)	.051 (1.30)	.059 (1.50)	.067 (1.70)	.067 (1.70)	.067 (1.70)
Term. (P)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	50	50	50	50	50
Cap. in uF	.010				
	.012				
	.015				
	.018				
	.022				
	.027				
	.033				
	.039				
	.047				
	.056				
	.068				
	.082				
	.10				
	.12				
	.15				
	.18				
	.22				
	.27				
	.33				
	.39				
	.47				
	.56				
	.68				
	.82				
	1.0				
	1.2				
	1.5				
	1.8				
	2.2				
	2.7				

Z5U Dielectric General Specifications

Capacitance Range: .01 to 2.2 uF

Capacitance Tolerances: $\pm 20\%$, $+ 80\%$, $- 20\%$, and $+ 100\%, - 0\%$

Operating Temperature Range: $+ 10^{\circ}\text{C}$ to $+ 85^{\circ}\text{C}$

Temperature Characteristic: $+ 22\%, - 56\%$

Voltage Rating: 50 Vdc @ $+ 85^{\circ}\text{C}$

Dissipation Factor: 3.0% (max.) @ 0.5 ± 0.1 Vrms and 1.0 kHz

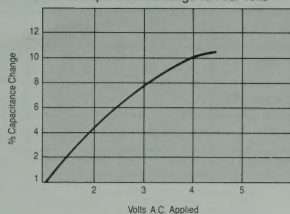
Insulation Resistance @ $+ 25^{\circ}\text{C}$ and Rated Vdc: 1000 ohm-farads (min.).

Dielectric Withstanding Voltage: 250% of rated voltage for 5 ± 1 seconds, 50 milliamps (max.)

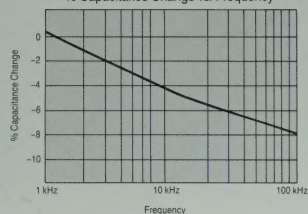
OTHER SIZES

PART NO.	VJ0603
Length (L)	.063 (1.60)
Width (W)	.031 (0.80)
Thickness (T)	.035 (0.89)
Term. (P)	.005 (.127)
Voltage (Vdc)	50
Cap. in uF	.010
	.012
	.015
	.018
	.022
	.027
	.033
	.039
	.047
	.056
	.068
	.082
	.10
	.12
	.15
	.18
	.22
	.27
	.33
	.39
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	1.0
	1.2
	1.5
	1.8
	2.2
	2.7

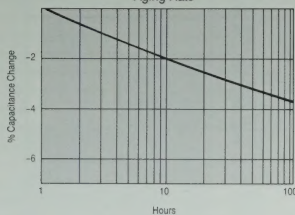
% Capacitance Change vs. A.C. Volts



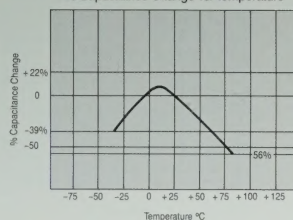
% Capacitance Change vs. Frequency



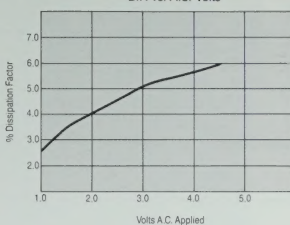
Aging Rate



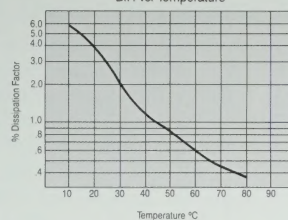
% Capacitance Change vs. Temperature



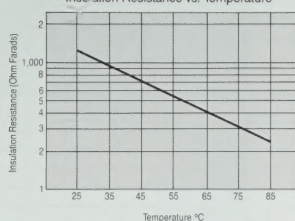
D.F. vs. A.C. Volts



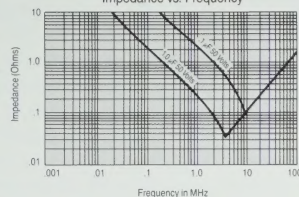
D.F. vs. Temperature



Insulation Resistance vs. Temperature

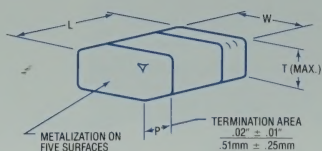
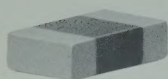


Impedance vs. Frequency





BX DIELECTRIC



HOW TO ORDER

VJ0805 **X** **103** **K** **X** **A** **M** **T**

Style _____

Temperature Characteristic
X = BX ± 15% @ 0 Vdc and + 15%,
- 25% at rated Vdc

Capacitance
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow.

Capacitance Tolerance
K (± 10%) and M (± 20%) are standard.
J (± 5%) also available.

Termination Material
H = Palladium-Silver, Sn62 Solder coated finish F = Palladium-Silver
N = Silver, Nickel Barrier, Sn62 Solder coated finish X = Silver, Nickel
Barrier, Tin Plated finish

VOLTAGE (Vdc)
X = 25 A = 50

MARKING OPTION Standard is No Marking
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

SURFACE MOUNT STANDARD SIZES

PART NO.	VJ0805	VJ1206	VJ1210	VJ1812	VJ1825
Length (L)	.079 (2.00)	.126 (3.20)	.126 (3.20)	.177 (4.50)	.177 (4.50)
Width (W)	.049 (1.25)	.063 (1.60)	.098 (2.50)	.126 (3.20)	.252 (6.40)
Thickness (T)	.051 (1.30)	.059 (1.50)	.067 (1.70)	.067 (1.70)	.067 (1.70)
Term. (P)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	50 25	50 25	50 25	50 25	50 25
Cap. in pF	100 Available in NPO (COG)	120 Available in NPO (COG)			
150					
180					
220					
270					
330					
390					
470					
560					
680					
820					
1000					
1200					
1500					
1800					
2200					
2700					
3300					
3900					
4700					
5600					
6800					
8200					
Cap. in uF	.010				
.012					
.015					
.018					
.022					
.027					
.033					
.039					
.047					
.056					
.068					
.082					
.10					
.12					
.15					
.18					
.22					
.27					
.33					
.39					
.47					
.56					
.68					
.82					
1.0					

Dimensions on length, width and termination are ± .01" (± .25 mm), except VJ0603 termination is .005" (.127 mm), minimum.

NOTE: Body dimensions do not include solder build-up.

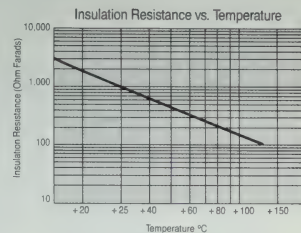
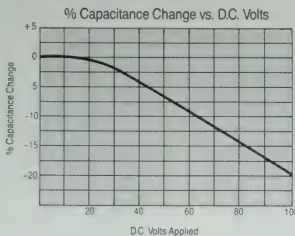
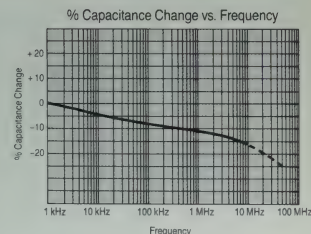
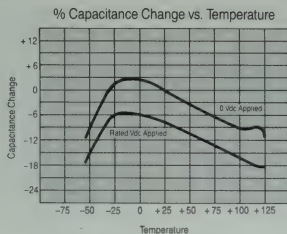
Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

Capacitance values offered in following significant figures: 10 12 15 18 22 27 33 39 47 56 68 82

For additional capacitance values and voltages not shown, contact the factory.

OTHER SIZES

PART NO.	VJ0603	VJ0907	VJ1808	VJ2224
Length (L)	.063 (1.60)	.090 (2.29)	.180 (4.57)	.220 (5.59)
Width (W)	.031 (0.80)	.070 (1.78)	.080 (2.03)	.240 (6.10)
Thickness (T)	.035 (0.89)	.060 (1.52)	.065 (1.65)	.070 (1.78)
Term. (P)	.005 (.127)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (VDC)	50 25	50 25	50 25	50 25
Cap. in pF	100 120 150 180 220 270 330 390 470 560 680 820 1000 1200 1500 1800 2200 2700 3300 3900 4700 5600 6800 8200	Available in NPO (COG)	Available in NPO (COG)	
Cap. in uF	.010 .012 .015 .018 .022 .027 .033 .039 .047 .056 .068 .082 .10 .12 .15 .18 .22 .27 .33 .39 .47 .56 .68 .82 1.0			



BX Dielectric General Specifications

Capacitance Range: 470 pF to 1.0 uF

Capacitance Tolerances: $\pm 5\%$, $\pm 10\%$ and $\pm 20\%$

Operating Temperature Range: -55°C to $+125^{\circ}\text{C}$

Temperature Characteristic: $\pm 15\%$ @ 0 Vdc, $+15\%$,
- 25% @ rated voltage

Voltage Ratings: 50 & 25 VDC @ $+125^{\circ}\text{C}$

Dissipation Factor: 2.5% (max.) @ $+25^{\circ}\text{C}$ and 1.0 Vrms and 1 kHz

Dissipation Factor: 2.0% (max.) @ $+125^{\circ}\text{C}$ and 1.0 Vrms and 1 kHz

Insulation Resistance @ $+25^{\circ}\text{C}$ and rated Vdc:

100,000 megohms (min.) or 1000 ohm-farads (min.),
whichever is less

Insulation Resistance @ $+125^{\circ}\text{C}$ and rated Vdc:

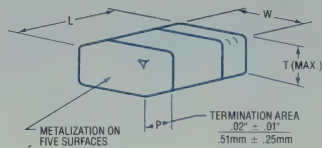
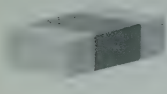
10,000 megohms (min.) or 100 ohm-farads (min.),
whichever is less

Dielectric Withstanding Voltage: 250% of rated voltage for 5 ± 1 seconds, 50 milliamps (max.).

Aging Rate: 1% (maximum) per decade



HIGH VOLTAGE CHIP CAPACITORS



HOW TO ORDER

VJ1206 **Y** **103** **K** **X** **E** **M** **T**

Style

Temperature Characteristic
A = NPO ... $0 \pm 30\text{ppm}/^\circ\text{C}$
Y = X7R ... $\pm 15\%$

Capacitance
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow.

Capacitance Tolerance
NPO:
J ($\pm 5\%$) and K ($\pm 10\%$) are standard.
F ($\pm 1\%$) and G ($\pm 2\%$) also available.
X7R: K ($\pm 10\%$) and M ($\pm 20\%$) are standard.
J ($\pm 5\%$) also available.

Termination Material
H = Palladium-Silver, Sn62 Solder coated finish F = Palladium-Silver
N = Silver, Nickel Barrier, Sn62 Solder coated finish X = Silver, Nickel
Barrier, Tin Plated finish

VOLTAGE (Vdc)
E = 500

MARKING OPTION Standard is No Marking
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

SURFACE MOUNT STANDARD SIZES

PART NO.	VJ1206		VJ1210		VJ1812		VJ1825	
Length (L)	.126 (3.20)		.126 (3.20)		.177 (4.50)		.177 (4.50)	
Width (W)	.063 (1.60)		.098 (2.50)		.126 (3.20)		.252 (6.40)	
Thickness (T)	.070 (1.78)		.070 (1.78)		.075 (1.91)		.067 (1.70)	
Term. (P)	.020 (.508)		.020 (.508)		.020 (.508)		.020 (.508)	
Voltage (Vdc)	500		500		500		500	
Dielectric	NPO	X7R	NPO	X7R	NPO	X7R	NPO	X7R
Cap. in pF	47							
	56							
	68							
	82							
	100							
	120							
	150							
	180							
	220							
	270							
	330							
	390							
	470							
	560							
	680							
	820							
	1,000							
	1,200							
	1,500							
	1,800							
	2,200							
	2,700							
	3,300							
	3,900							
	4,700							
	5,600							
	6,800							
	8,200							
Cap. in uF	.010							
	.012							
	.015							
	.018							
	.022							
	.027							
	.033							
	.039							
	.047							
	.056							
	.068							
	.082							
	.10							
	.12							
	.15							

Dimensions on length, width and termination are $\pm .01"$ ($\pm .25\text{ mm}$)
Dimensions in parenthesis are in millimeters. Other dimensions are
in inches.

Capacitance values offered in following significant figures: 10 11 12
13 15 16 18 20 22 24 27 30 33 36 39 43 47 51 56 62 68 75 82 91

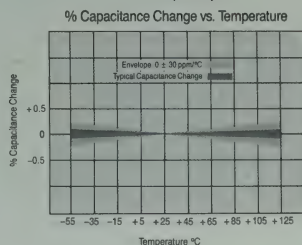
NOTE: Body dimensions do not include solder build-up.

For additional capacitance values and voltages not shown, contact
the factory.

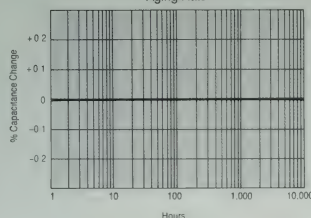
OTHER SIZES

PART NO.	VJ1808	VJ2224
Length (L)	.180 (4.57)	.220 (5.59)
Width (W)	.080 (2.03)	.240 (6.10)
Thickness (T)	.075 (1.91)	.080 (2.03)
Term. (P)	.020 (.508)	.020 (.508)
Voltage (Vdc)	500	500
Dielectric	NPO	X7R
Cap. in pF	47	
	56	
	68	
	82	
	100	
	120	
	150	
	180	
	220	
	270	
	330	
	390	
	470	
	560	
	680	
	820	
	1,000	
	1,200	
	1,500	
	1,800	
	2,200	
	2,700	
	3,300	
	3,900	
	4,700	
	5,600	
	6,800	
	8,200	
Cap. in uF	.010	
	.012	
	.015	
	.018	
	.022	
	.027	
	.033	
	.039	
	.047	
	.056	
	.068	
	.082	
	.10	
	.12	
	.15	

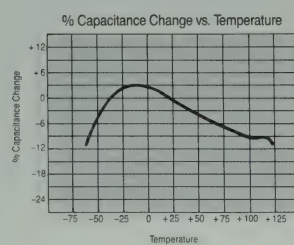
NPO (COG)



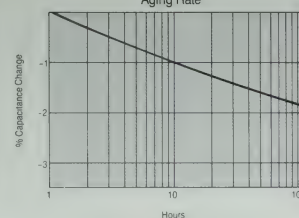
Aging Rate



X7R



Aging Rate



High Voltage General Specifications

Capacitance Range: NPO (COG) 47-5600 pF

X7R (1000-150,000 pF)

Capacitance Tolerances: $\pm 5\%$, $\pm 10\%$, $\pm 20\%$

and $+80\%$, -20%

Operating Temperature Range: -55°C to $+125^\circ\text{C}$

Temperature Characteristic: NPO (COG) = $0 \pm 30 \text{ ppm/}^\circ\text{C}$

X7R = $\pm 15\%$ with 0 Vdc applied

Voltage Rating: 500 Vdc @ $+125^\circ\text{C}$.

Dissipation Factor at 1.0 Vrms and 25°C :

NPO (COG): (0.1% max.) @ 1 MHZ for $\leq 1000\text{pF}$

(0.1% max.) @ 1 KHZ for $> 1000\text{pF}$

X7R: (2.5% max.) @ 1 KHZ

Insulation Resistance @ $+25^\circ\text{C}$ and rated Vdc:

100,000 megohms (min.) or 1000 ohm-farads (min.), whichever is less

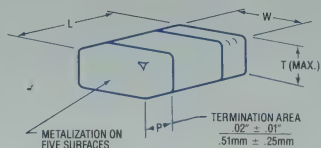
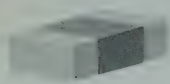
Insulation Resistance: @ $+125^\circ\text{C}$ and rated Vdc:

10,000 megohms (min.) or 100 ohm-farads (min.), whichever is less

Dielectric Withstanding Voltage: 1000 Vdc (Immersed in a suitable insulating media)



HIGH Q DIELECTRIC



HOW TO ORDER

VJ0805

Q

101

K

X

A

M

T

Style

Temperature Characteristic

Capacitance

Capacitance Tolerance

Termination Material

VOLTAGE (Vdc)

MARKING OPTION

PACKAGING OPTION

Q = NPO...0 ± 30ppm/°C

Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow. An 'R' denotes a decimal point in which case all figures are significant.

C = ± .25pF
F = ± 1%
J = ± 5%

D = ± .5pF
G = ± 2%
K = ± 10%

F = Palladium-Silver
Barrier, Tin Plated finish

A = 50 B = 100 C = 200

A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle

PART NO.	VJ0805			VJ1206			VJ1210		
Length (L)	.079 (2.00)			.126 (3.20)			.126 (3.20)		
Width (W)	.049 (1.25)			.063 (1.60)			.098 (2.50)		
Thickness (T)	.051 (1.30)			.059 (1.50)			.067 (1.70)		
Term. (P)	.020 (.508)			.020 (.508)			.020 (.508)		
Voltage (Vdc)	200	100	50	200	100	50	200	100	50
Cap. in pF	1.0								
	1.2								
	1.5								
	1.8								
	2.2								
	2.7								
	3.3								
	3.9								
	4.7								
	5.6								
	6.8								
	8.2								
	10								
	12								
	15								
	18								
	22								
	27								
	33								
	39								
	47								
	56								
	68								
	82								
	100								
	120								
	150								
	180								
	220								
	270								
	330								
	390								
	470								
	560								
	680								

Dimensions on length, width and termination are ± .01" (± .25 mm).

Capacitance values are offered in the following significant figures: 10 11 12 13 15 16 18 20 22 24 27 30 33 36 39 43 47 51 56 62 68 75 82 91

Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

NOTE: Body dimensions do not include solder build-up.

For additional capacitance values and voltages not shown, contact the factory.

HIGH Q Dielectric General Specifications

Capacitance Range: 1.0 pF to 680 pF

Operating Temperature Range: -55°C to $+125^{\circ}\text{C}$

Temperature Characteristic:

NPO (COG) = $0 \pm 30 \text{ ppm}/^{\circ}\text{C}$

Voltage Ratings: 200, 100 and 50 Vdc @ $+125^{\circ}\text{C}$

Dissipation Factor: 0.1% (max.) @ $+25^{\circ}\text{C}$ and $+125^{\circ}\text{C}$ @ 1.0 Vrms
and 1 kHz for $>1000 \text{ pF}$ 1 MHz for $\leq 1000 \text{ pF}$

Insulation Resistance @ $+25^{\circ}\text{C}$ and rated Vdc:

100,000 megohms (min.) or 1000 ohm-farads (min.), whichever is less

Insulation Resistance @ $+125^{\circ}\text{C}$ and rated Vdc:

10,000 megohms (min.) or 100 ohm-farads (min.), whichever is less

Dielectric Withstanding Voltage: 250% of rated voltage for 5 ± 1
seconds, 50 milliamps (max.)

Capacitance Tolerances

C = $\pm 0.25 \text{ pF}$ (1.0 to 25 pF)

D = $\pm 0.50 \text{ pF}$ (1.0 to 50 pF)

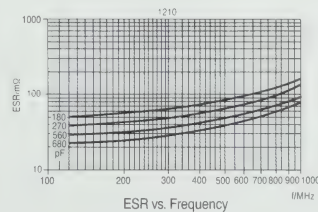
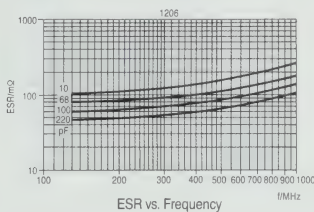
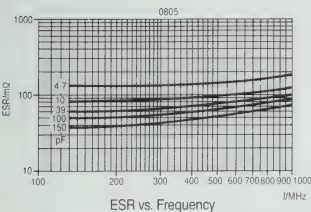
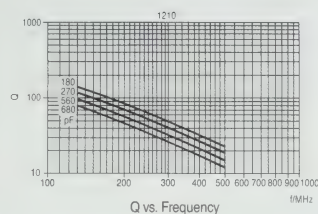
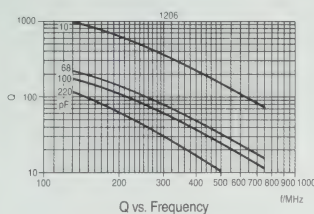
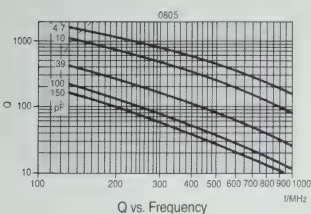
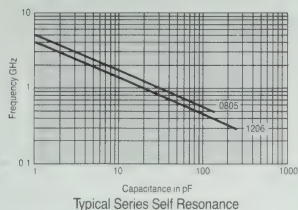
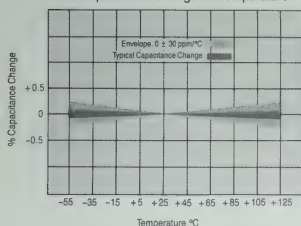
F = $\pm 1\%$ (25 pF & higher)

G = $\pm 2\%$ (13 pF and up)

J = $\pm 5\%$ (5 pF and up)

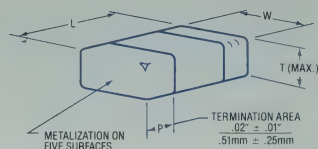
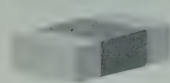
K = $\pm 10\%$ (2.5 pF and up)

% Capacitance Change vs. Temperature





CDR (BP & BX) CHIP CAPACITORS



HOW TO ORDER

Style CDR01 BP 100 A K Y M*

**Rated Temperature and Voltage-
Temperature Limits**
B = -55°C to +125°C temperature range
P = 0 ±30 ppm/°C
X = ±15% @ 0 Vdc and +15%,
-25% @ rated voltage

Capacitance
The nominal capacitance value, expressed in picofarads (pF), is identified by a three-digit number. The first two digits represent significant figures and the last digit specifies the number of zeros to follow. An 'R' denotes a decimal point in which case all figures are significant.

Rated Voltage
A = 50 Vdc B = 100 Vdc

Capacitance Tolerance
Per MIL-C-55681

Termination Material
S = Solder-coated M = Metal-coated
U = Nickel Barrier Solder coated Y = Nickel Barrier Tin Plated

FAILURE RATE LEVEL (per 1000 hours)
M = 1.0% P = 0.1% R = .01% S = .001%

*Contact factory for current qualification status.

PART NO.	CDR01	CDR02	CDR03	CDR04	CDR06
MIL-C-55681	/1	/1	/1	/1	/3
Length (L)	.080 (2.03)	.180 (4.57)	.180 (4.57)	.180 (4.57)	.225 (5.72)
Width (W)	.050 (1.27)	.050 (1.27)	.080 (2.03)	.125 (3.18)	.250 (6.35)
Thickness (T)	.055 (1.40)	.055 (1.40)	.080 (2.03)	.080 (2.03)	.080 (2.03)
Term. (P)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)	.020 (.508)
Voltage (Vdc)	BP 100 BX 100 BX 50	BP 100 BX 100 BX 50	BP 100 BX 100 BX 50	BP 100 BX 100 BX 50	BP 100 BX 100 BX 50
Cap. in pF	10				
	12				
	15				
	18				
	22				
	27				
	33				
	39				
	47				
	56				
	68				
	82				
	100				
	120				
	150				
	180				
	220				
	270				
	330				
	390				
	470				
	560				
	680				
	820				
	1,000				
	1,200				
	1,500				
	1,800				
	2,200				
	2,700				
	3,300				
	3,900				
	4,700				
	5,600				
	6,800				
	8,200				
Cap. in uF	.010				
	.012				
	.015				
	.018				
	.022				
	.027				
	.033				
	.039				
	.047				
	.056				
	.068				
	.082				
	.10				
	.12				
	.15				
	.18				
	.22				
	.27				
	.33				
	.39				
	.47				

Length and width dimension are ±.015" (±.38 mm) except CDR06 (+.020", -.015" and +.51 mm, -.38 mm).

Termination dimension is ±.010" (±.25 mm).

Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

PART NO.	CDR31				CDR32				CDR33			
MIL-C-55681	/7				/8				/9			
Length (L)	.078 (2.00)				.125 (3.20)				.125 (3.20)			
Width (W)	.049 (1.25)				.062 (1.60)				.098 (2.50)			
Thickness (T)	.051 (1.30)				.051 (1.30)				.059 (1.50)			
Term. (P)	.020 (.50)				.020 (.50)				.020 (.50)			
Voltage (Vdc)	BP 100	BP 50	BX 100	BX 50	BP 100	BP 50	BX 100	BX 50	BP 100	BP 50	BX 100	BX 50
Cap. in pF	1.0											
	1.2											
	1.5											
	1.8											
	2.2											
	2.7											
	3.3											
	3.9											
	4.7											
	5.6											
	6.8											
	8.2											
	10											
	12											
	15											
	18											
	22											
	27											
	33											
	39											
	47											
	56											
	68											
	82											
	100											
	120											
	150											
	180											
	220											
	270											
	330											
	390											
	470											
	560											
	680											
	820											
	1000											
	1200											
	1500											
	1800											
	2200											
	2700											
	3300											
	3900											
	4700											
	5600											
	6800											
	8200											
Cap. in uF	.010											
	.012											
	.015											
	.018											
	.022											
	.027											
	.033											
	.039											
	.047											
	.056											
	.068											
	.082											
	.10											

CDR (MIL-C-55681)

General Specifications

Capacitance Range: 1.0 pF to 470,000 pF

Capacitance Tolerances: per MIL-C-55681

Operating Temperature Range: -55°C to +125°C

Voltage-Temperature Limits:

BX: $\pm 15\%$ @ 0 Vdc; +15%, -25% with rated Vdc appliedBP: $0 \pm 30\text{ppm}/^\circ\text{C}$ with and without rated Vdc applied

Voltage Ratings: 100 Vdc and 50 Vdc

Insulation Resistance @ +25°C and rated Vdc:

100,000 megohms or 1000 ohm-farads (min.), whichever is less

Insulation Resistance @ +125°C and rated Vdc:

10,000 megohms or 100 ohm-farads (min.), whichever is less

Dissipation Factor (max.) @ +25°C: BX (2.5%); BP (0.15%)

Dielectric Withstanding Voltage: 250% rated Vdc for 5 ± 1 secondCapacitance Measuring Frequency: 10-100 pF @ 1 MHz ± 50 Hz; Over 100 pF (@ 1 kHz ± 50 Hz)Signal Measuring Voltage: 1.0 ± 0.2 Vrms

CDR Termination Designation

S = Solder Coated

M = Palladium Silver

U = Base Metalization—Barrier Metal Solder Coated

Y* = Base Metalization—Barrier Metal Tin Plated (100% Tin)

*Equivalent to "W" termination designation in MIL-C-55681B, Amendment 5.

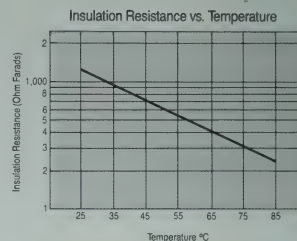
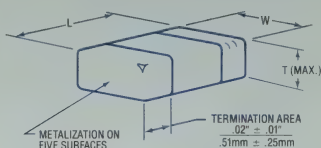
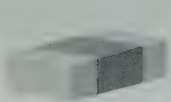
Tolerances on Length, Width and Termination:

CDR31 and CDR32: $\pm .008$ (.20)CDR33: $\pm .010$ (.25)

Dimensions are for bare chips. For solder coated terminations add .012 (.30) to the width and thickness. Add .020 (.50) to the length of CDR31 and CDR32. Add .023 (.60) to the length of the CDR33.

Dimensions in parenthesis are in millimeters. Other dimensions are in inches.

LOW PROFILE Z5U DIELECTRIC DECOUPLING CAPACITORS—7965 SERIES



Low Profile Z5U Dielectric General Specifications:

Capacitance Range: .2 to .33uF

Capacitance Tolerance: -0, +100%

Operating Temperature Range: +10°C to +85°C

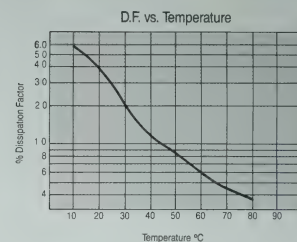
Temperature Characteristics: +22%, -56%

Voltage Rating: 50 Vdc @ +85°C

Dissipation Factor: 3.0% (max.) @ $0.5 \pm .1$ Vrms and 1.0 kHz

Insulation Resistance @ +25°C and rated Vdc: 1000 ohm-farads (min.)

Dielectric Withstanding Voltage: 250% of rated Vdc for 5 ± 1.0 seconds with 50 milliamps (max.)

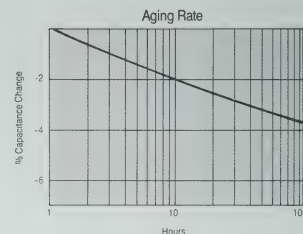
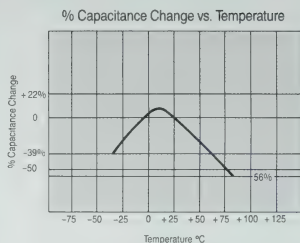


Physical Dimensions

Length: $.126(3.20) \pm .008(.20)$

Width: $.098(2.50) \pm .008(.20)$

Thickness (max.): $.026(.66)$



HOW TO ORDER

Style **7965** **U** **204** **P** **X** **A** **M** **T**

Temperature Characteristic
U = Z5U ... +22%, -56%

Capacitance
Expressed in picofarads (pF). First two digits are significant figures. Last digit specifies number zeros to follow.

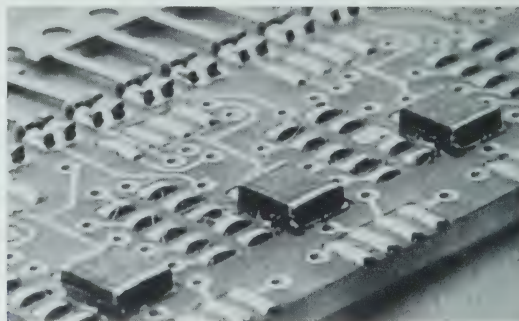
Capacitance Tolerance
P = +100%, -0

Termination Material
X = Silver, Nickel Barrier, Tin Plated finish

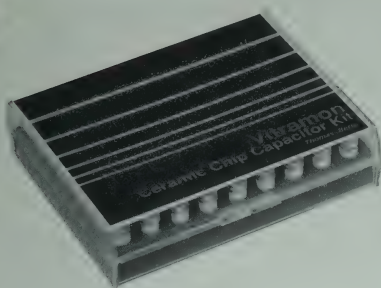
VOLTAGE (Vdc)
A = 50

MARKING OPTION Standard is No Marking
A = No Marking M = EIA Marking H = EIA Marking
Plus "V" for Vendor Identity (See Page 19.)

PACKAGING OPTION Standard is Bulk
T = 7" Reel R = 13" Reel (See Page 19.) B = Bulk W = Waffle



CHIP KITS



Chip Kits

AVAILABLE THROUGH VITRAMON DISTRIBUTORS

These Ceramic Chip Capacitor Kits provide a wide range of capacitance, dielectric types and tolerances to choose from. Each kit contains 6200 pieces, all of which contain our tin plated nickel barrier terminations.

Each kit has a selection of 62 nominal values (100 pieces each) in three dielectric types NPO (COG), X7R and Z5U.

All parts have our tin plated nickel barrier terminations

Each kit contains a non-metallic tweezer

To order specify #0805 kit or #1206 kit

0805 KIT

VIAL NO.	PART NO.	VIAL NO.	PART NO.	VIAL NO.	PART NO.
1	VJ0805A1R0DXAAB	22	VJ0805A121JXAAB	43	VJ0805Y152KXAAB
2	VJ0805A2R2DXAAB	23	VJ0805A131JXAAB	44	VJ0805Y222KXAAB
3	VJ0805A2R7DXAAB	24	VJ0805A151JXAAB	45	VJ0805Y272KXAAB
4	VJ0805A3R3DXAAB	25	VJ0805A161JXAAB	46	VJ0805Y332KXAAB
5	VJ0805A3R9DXAAB	26	VJ0805A181JXAAB	47	VJ0805Y472KXAAB
6	VJ0805A4R7DXAAB	27	VJ0805A201JXAAB	48	VJ0805Y562KXAAB
7	VJ0805A6R8DXAAB	28	VJ0805A221JXAAB	49	VJ0805Y682KXAAB
8	VJ0805A8R2DXAAB	29	VJ0805A241JXAAB	50	VJ0805Y103KXAAB
9	VJ0805A100JXAAB	30	VJ0805A271JXAAB	51	VJ0805Y153KXAAB
10	VJ0805A120JXAAB	31	VJ0805A301JXAAB	52	VJ0805Y223KXAAB
11	VJ0805A150JXAAB	32	VJ0805A331JXAAB	53	VJ0805Y273KXAAB
12	VJ0805A180JXAAB	33	VJ0805A361JXAAB	54	VJ0805Y333KXAAB
13	VJ0805A220JXAAB	34	VJ0805A391JXAAB	55	VJ0805Y473KXAAB
14	VJ0805A270JXAAB	35	VJ0805A431JXAAB	56	VJ0805U103MXAAB
15	VJ0805A330JXAAB	36	VJ0805A471JXAAB	57	VJ0805U153MXAAB
16	VJ0805A390JXAAB	37	VJ0805A561JXAAB	58	VJ0805U223MXAAB
17	VJ0805A470JXAAB	38	VJ0805A621JXAAB	59	VJ0805U333MXAAB
18	VJ0805A680JXAAB	39	VJ0805A681JXAAB	60	VJ0805U473MXAAB
19	VJ0805A820JXAAB	40	VJ0805A821JXAAB	61	VJ0805U683MXAAB
20	VJ0805A101JXAAB	41	VJ0805A102JXAAB	62	VJ0805U104MXAAB
21	VJ0805A111JXAAB	42	VJ0805Y102KXAAB		

1206 KIT

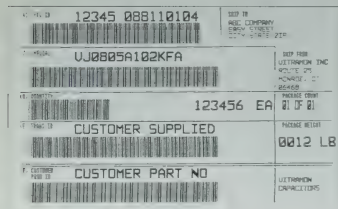
VIAL NO.	PART NO.	VIAL NO.	PART NO.	VIAL NO.	PART NO.
1	VJ1206A1R0DXAAB	22	VJ1206A131JXAAB	43	VJ1206Y222KXAAB
2	VJ1206A2R2DXAAB	23	VJ1206A151JXAAB	44	VJ1206Y272KXAAB
3	VJ1206A2R7DXAAB	24	VJ1206A181JXAAB	45	VJ1206Y472KXAAB
4	VJ1206A3R3DXAAB	25	VJ1206A221JXAAB	46	VJ1206Y682KXAAB
5	VJ1206A3R9DXAAB	26	VJ1206A271JXAAB	47	VJ1206Y103KXAAB
6	VJ1206A4R7DXAAB	27	VJ1206A301JXAAB	48	VJ1206Y153KXAAB
7	VJ1206A6R8DXAAB	28	VJ1206A331JXAAB	49	VJ1206Y273KXAAB
8	VJ1206A8R2DXAAB	29	VJ1206A361JXAAB	50	VJ1206Y333KXAAB
9	VJ1206A100JXAAB	30	VJ1206A391JXAAB	51	VJ1206Y473KXAAB
10	VJ1206A120JXAAB	31	VJ1206A471JXAAB	52	VJ1206Y683KXAAB
11	VJ1206A150JXAAB	32	VJ1206A511JXAAB	53	VJ1206Y104KXAAB
12	VJ1206A180JXAAB	33	VJ1206A561JXAAB	54	VJ1206U103ZXAAB
13	VJ1206A220JXAAB	34	VJ1206A681JXAAB	55	VJ1206U153ZXAAB
14	VJ1206A270JXAAB	35	VJ1206A102JXAAB	56	VJ1206U223ZXAAB
15	VJ1206A330JXAAB	36	VJ1206A122JXAAB	57	VJ1206U333ZXAAB
16	VJ1206A390JXAAB	37	VJ1206A152JXAAB	58	VJ1206U473ZXAAB
17	VJ1206A470JXAAB	38	VJ1206A182JXAAB	59	VJ1206U683ZXAAB
18	VJ1206A680JXAAB	39	VJ1206A222JXAAB	60	VJ1206U104ZXAAB
19	VJ1206A820JXAAB	40	VJ1206A272JXAAB	61	VJ1206U154ZXAAB
20	VJ1206A101JXAAB	41	VJ1206Y102KXAAB	62	VJ1206U224ZXAAB
21	VJ1206A111JXAAB	42	VJ1206Y152KXAAB		



BAR CODE LABEL STANDARDS

Outer Shipping Container—Option 1

Format: EIA*-556
 Symbology: Code 39
 Density: 5.0 CPI
 Label Size: 4.0 inch x 6.5 inch
 (102mm x 165mm)

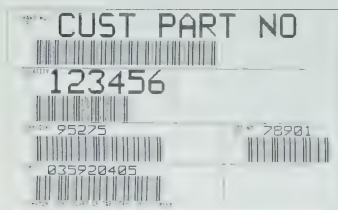


Description	EIA* ID	Max Char	Char Type†	Bar Coded
A—Supplied Package ID	4S	14	AN	Yes
B—Special—(Vendor PN)	Z	18	AN	Yes
C—Quantity—In Package	Q	6	N	Yes
D—Transaction No.	E	18	AN	Yes
E—Customer Product ID	P	18	AN	Yes
F—Package Weight		4	TEXT	No
G—Package Count		4	TEXT	No
H—Product Description		48	TEXT	No
I—Ship To Address		75	TEXT	No
J—Ship From Address		48	TEXT	No

*Electronic Industries Association

Outer Shipping Container—Option 2

Format: AIAG*-B3
 Symbology: Code 39
 Density: 5.0 CPI
 Label Size: 4.0 inch x 6.5 inch
 (102mm x 165mm)



Description	AIAG* ID	Max Char	Char Type†	Bar Coded
A—Customer Part Number	P	14	AN	Yes
B—Quantity In Package	Q	6	N	Yes
C—Vendor ID Number	V	9	AN	Yes
D—Vendor Serial (Pack) No.	S	9	AN	Yes
E—Lot ID Number	L	5	N	Yes
F—Vendor Name/ Address		46	AN	No

*Automotive Industries Action Group

Reel Label—Option 3

Format: Vitramon Standard
 Symbology: Code 39
 Density: 6.4 CPI
 Label Size: 2.0 inch x 3.0 inch (51mm x 76mm)



Description	Field ID	Max Char	Char Type†	Bar Coded
A—Customer Part Number	P	14	AN	Yes
B—Quantity In Package	Q	6	N	Yes
C—Vendor ID Number	V	9	AN	Yes
D—Vendor Serial (Pack) No.	S	9	AN	Yes
E—Lot ID Number	L	5	N	Yes
F—Vendor Name/ Address		46	AN	No

†A = Alpha N = Numeric AN = Alpha Numeric

Bar code labeling is provided by customer request.

PACKAGING



Capacitors with solder dipped terminations are not available in tape and reel packaging.

Tape and reel packaging is provided by customer request. To specify 7" reel use "T" in part number. For 13" reel use "R" in part number.

Body Size	Tape Size	Approximate *Qty. Per Reel	
		7"	13"
0805	8 mm	2500 - 4000	10,000
1206	8 mm	2000 - 3500	10,000
1210	8 mm	2000 - 3000	10,000
1812	12 mm	1000 - 1400	5000
1825	12 mm	1000 - 1400	5000

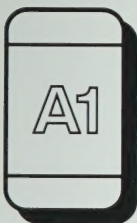
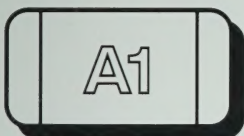
*Actual quantity depends on chip thickness.

REFERENCE: EIA standard RS-481 — "Taping of Surface Mount Components for Automatic Placement."

VITRAMON* uses only embossed plastic tape and rigid plastic reels. Cover tapes and reels are anti-static.



CHIP MARKING SYSTEM



Marking is provided by customer request. To specify alpha numeric capacitance code only use "M" in part number. To specify alpha numeric capacitance code plus vendor identity use "H" in part number. "V" for Vitramon precedes alpha numeric capacitance code.

LETTER	0	1	2	3	4	5	6
A	1.0	10	100	1,000	10,000	100,000	1,000,000
B	1.1	11	110	1,100	11,000	110,000	1,100,000
C	1.2	12	120	1,200	12,000	120,000	1,200,000
D	1.3	13	130	1,300	13,000	130,000	1,300,000
E	1.5	15	150	1,500	15,000	150,000	1,500,000
F	1.6	16	160	1,600	16,000	160,000	1,600,000
G	1.8	18	180	1,800	18,000	180,000	1,800,000
H	2.0	20	200	2,000	20,000	200,000	2,000,000
J	2.2	22	220	2,200	22,000	220,000	2,200,000
K	2.4	24	240	2,400	24,000	240,000	2,400,000
L	2.7	27	270	2,700	27,000	270,000	2,700,000
M	3.0	30	300	3,000	30,000	300,000	3,000,000
N	3.3	33	330	3,300	33,000	330,000	3,300,000
P	3.6	36	360	3,600	36,000	360,000	3,600,000
Q	3.9	39	390	3,900	39,000	390,000	3,900,000
R	4.3	43	430	4,300	43,000	430,000	4,300,000
S	4.7	47	470	4,700	47,000	470,000	4,700,000
T	5.1	51	510	5,100	51,000	510,000	5,100,000
U	5.6	56	560	5,600	56,000	560,000	5,600,000
V	6.2	62	620	6,200	62,000	620,000	6,200,000
W	6.8	68	680	6,800	68,000	680,000	6,800,000
X	7.5	75	750	7,500	75,000	750,000	7,500,000
Y	8.2	82	820	8,200	82,000	820,000	8,200,000
Z	9.1	91	910	9,100	91,000	910,000	9,100,000
a	2.5	25	250	2,500	25,000	250,000	2,500,000
b	3.5	35	350	3,500	35,000	350,000	3,500,000
d	4.0	40	400	4,000	40,000	400,000	4,000,000
e	4.5	45	450	4,500	45,000	450,000	4,500,000
f	5.0	50	500	5,000	50,000	500,000	5,000,000
m	6.0	60	600	6,000	60,000	600,000	6,000,000
n	7.0	70	700	7,000	70,000	700,000	7,000,000
t	8.0	80	800	8,000	80,000	800,000	8,000,000
y	9.0	90	900	9,000	90,000	900,000	9,000,000
	x1.0	x10	x100	x1,000	x10,000	x100,000	x1,000,000

1. Orientation is vendor optional.
2. The marking will be in legible contrast to body.
3. Reference EIA RS-198.
4. EIA code only on 0805 and larger.
5. Vendor identity—plus EIA code available in 1206 and larger sizes.

Application Notes

1. Termination Selection:

- Our tin plated nickel barrier termination (Termination Code "X") is recommended for all attachment methods which use solder.
- Use silver palladium (Termination Code "F") for all installation methods other than solder, such as conductive epoxy, welding, etc.

2. Chip Size Selection Versus Solder Profile:

- 0805, 1206, 1210 and 1812 may be used in all three solder systems shown in the Solder Profile Curves.
- Size larger than 1812 (1825, etc.) should be reflow or vapor phase soldered. Wave solder is not recommended for these larger chip capacitor body sizes.

3. Soldering Flux:

A mildly activated rosin flux is recommended.

4. Solder Type:

Sn60 or Sn62 is preferred.

5. Preheat:

Follow the soldering curves shown.

6. Solder Techniques:

Reflow, wave or vapor-phase systems are recommended.

Attachment by soldering iron is not recommended—however, if used, the following precautions should be followed:

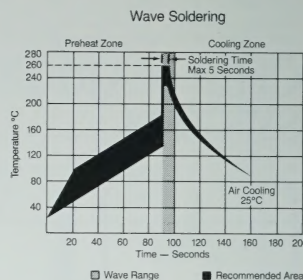
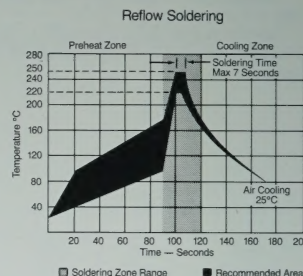
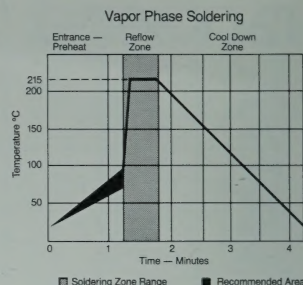
- Use a low wattage iron (30 watts maximum)
- Use the lowest tip temperature possible (280°C maximum).
- Use a soldering tip no greater than .120" (3mm) diameter.
- Preheat the chip capacitor to 150°C minimum.
- Do not touch the bare ceramic chip capacitor body with the soldering iron. Apply the heat through the solder (iron tip to mounting pad) or, if absolutely necessary, apply the iron tip to the chip termination metal.

7. Cooldown:

After soldering, allow the chip to cool at room ambient conditions, as an expedited cooldown (fans, cold cleaning solutions, etc.) could result in thermal shock cracking.

8. Cleaning:

Selection of an appropriate cleaning solvent is dependent upon the type of flux used. Cleaning in alcohols, water, hydrocarbons, or any of the common, halogenated degreaser solvents is not detrimental to our chip capacitors.





VITRAMON, INCORPORATED

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Monroe, CT 06468 (Ship)
TEL: (203) 268-6261
FAX: (203) 261-3670

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Bucks HP10 0HH England

■ **Vitramon Pty. Limited**
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● **Vitramon do Brasil Ltda.**
511 Rua Carmo do Rio Verde
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Sao Paulo, Brazil

● **Vitramon, Incorporated**
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and Technology
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Roanoke, VA 24012 (Ship)
TEL: (703) 982-6706
FAX: (703) 342-8652

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■ **Vitramon Japan Limited**
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● Manufacturing Plants

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Thomas & Betts
